

WHAT IS CLAIMED IS:

1. Apparatus for cleaning objects having generally irregular surface features, said apparatus comprising:

a partial enclosure having opposing side walls, a top wall joining said opposing side walls, a first opening at one end of said side walls and a second opening opposite said first opening;

an object support member for supporting said objects with the generally irregular surface features exposed for cleaning in said partial enclosure;

an air ionizing element arranged in said partial enclosure symmetrically about said generally irregular surface features, said air ionizing element directing a curtain-like stream of ionized air onto said generally irregular surface features of said objects thereby neutralizing electrostatic electric field intensities and dislodging particles from said generally irregular surface features; and,

means for exhausting particles dislodged from said generally irregular surface features, said particles being captured in a downward flow of directed air and directed away from said objects.

2. The apparatus recited in claim 1 wherein said object support member comprises a surface for supporting a plurality of said objects with said generally irregular surface features exposed for cleaning and transporting said plurality of objects along a path between said first opening and said second opening of said partial enclosure.

3. The apparatus recited in claim 1 wherein said air ionizing element is movable from a first position proximate to said first opening, to a second position proximate to said second opening.

4. The apparatus recited in claim 1 further comprising a means for introducing a downward directed flow of air inside said partial enclosure, said downward directed flow of air producing positive pressure

inside said partial enclosure between said first opening and said second opening.

5. The apparatus recited in claim 4 wherein said means for introducing a downward directed flow of air comprises:

a source of air for providing said downward directed flow of air;

at least one filter in fluid communication with said downward directed flow of air; and,

a perforated plenum arranged between said partial enclosure and said at least one filter for uniformly distributing said downward directed flow of air.

6. The apparatus recited in claim 1, wherein said air ionizing element comprises an air knife cooperatively associated with an air ionizing bar.

7. The apparatus recited in claim 1 wherein said top wall comprises a filter chamber arranged at least partially in a path in fluid communications with said downward flow of directed air; and, wherein a pair of filter panels are arranged in said top wall between said source of said curtain-like stream of ionized air and said filter chamber.

8. The apparatus recited in claim 7 wherein a perforated metallic plate is positioned between said filter chamber and said partial enclosure for regulating the volume of exhausted air.

9. A method of cleaning electrostatically bound particles from objects having generally irregular surface features, said method comprising the steps of:

providing a cleaning apparatus comprising a partially enclosed enclosure; a source of filtered directed air; and an ionizing member arranged in said partially enclosed enclosure for bombarding said objects with ions;

providing an object support member for supporting said objects for cleaning in said cleaning apparatus;

arranging said objects on said object support member with said generally irregular surface features exposed for cleaning;

positioning said objects on said object support member for exposure inside said partially enclosed enclosure;

directing a curtain-like stream of air across said generally irregular surface features of said objects;

ionizing said generally irregular surface features of said objects for a predetermined period of time, said step of ionizing comprising neutralizing static charges on said generally irregular surface features so as to dislodge particles electrostatically bonded on said generally irregular surface features;

continually exhausting said partially enclosed enclosure so as to eliminate said particles dislodged from said generally irregular surface features; and,

removing said objects from said partially enclosed enclosure.

10. The method recited in claim 9 wherein said step of ionizing said generally irregular surface features comprises the step of applying a voltage to the ionizing member in the range of about 7000 volts.

11. The method recited in claim 9 wherein said step of directing a curtain-like stream of air comprises the step of filtering said curtain-like stream of air prior to the step of directing.